

The natural climatic conditions of this section for early truck crops, and for that matter for all crops throughout the year, together with favorable soil conditions, place the agriculturists of this section most advantageously in position to make good crops when other sections are afflicted with adverse conditions.

An important factor of assistance to the farmers in this vicinity is the Weather Bureau service, with its forecasts of weather changes.

At all seasons this service is found of great benefit, and at no time has it proven more valuable than in its forecasts of last week, forecasting the severe weather change and great fall in temperature, enabling the truckers to make all possible efforts to offset the impending frost or freeze.

While this section, as already stated, suffered little from the freezing weather, the Weather Bureau warning made it possible for the truckers to take many precautions which without the forecast they would not have taken.

That the Weather Bureau service is of incalculable value to the farmers of this section every one will bear ample and full testimony. Its reports are eagerly looked for and its forecasts are heeded, every farmer being an inquirer during the season as to what the daily forecast may be.

The Daily States, New Orleans, La., May 1, 1903:

The warnings of the United States Weather Bureau for these frosts, although so much out of season, have been, as usual, exceptionally accurate. They were so timely as to enable protection of the extensive and valuable truck farming interests of the Southwest, which means the saving of thousands of dollars to this industry.

The Daily Picayune, New Orleans, La., May 2, 1903:

This is perhaps the most general and severe frost that has ever visited the Southwest so late in the spring. Just what the effects will be on the general crops can not be even conjectured. Trucking interests, which have reached enormous proportions during recent years in Louisiana and Texas, are likely to suffer the greatest damage from such unseasonable frost, as it is impossible at this time to protect all crops. However, the accurate warnings issued by the United States Weather Bureau were, through its complete and perfect system of distribution, placed in the hands of every truck-growing community which was threatened with frost by 9 a. m. Thursday, and this gave the growers time to protect extensively. Thus, the Weather Bureau has again saved the farmers of this section several hundred thousand dollars, as it has done in the case of every occurrence of severe weather in recent years. It is a notable fact that no severe weather makes its appearance without its approach being heralded by the ever-alert and efficient Weather Bureau forecasters.

In the latter part of the month the peach crop in southern Oregon was damaged by frost. The frost was accurately forecast, but protective measures are not generally employed in that section.

Flood.—At New Orleans the Mississippi River reached the highest stage of the flood of 1903, 20.4 feet on April 6 and 7, and for a few hours the stage was reported at 20.7 feet.

The Washington Post, of April 19, 1903, comments, editorially, as follows, regarding the work of the Weather Bureau:

The newspapers published in the lower Mississippi Valley pay high tribute to the Weather Bureau, acknowledging the accuracy of its predictions and their immense value to the people of that section. The New Orleans Times-Democrat says, for example:

"Before the organization of the old Signal Service, later changed to the Weather Bureau, the cane crop of Louisiana was frequently cut down one-half or three-fourths by the sudden descent of a freeze on the sugar district without a word of warning. To-day that is impossible. That problem in meteorology has been solved. The Weather Bureau may err in its 'probabilities' as to rain, but not as to a cold wave, and with telegraphic communication with the great Northwest, from which our cold weather comes, it is able to foretell the approach of a freeze four, five, and sometimes six days in advance. By the splendid system adopted for the dissemination of cold-wave signals, every planter in Louisiana is informed within a few hours of the prospective freeze, and is thus given ample time for preparation, and is able to windrow his cane or otherwise protect himself.

"We have been placed this year under another obligation to the Weather Bureau for its high-water news and predictions. It has kept the people of the lower Mississippi well informed of what they may expect in the way of high water, and its predictions have been subsequently verified by the facts."

It is easy for gentlemen in towns and cities, especially those who have no more than an idle and capricious interest in the weather, to sneer at the work of the Bureau when some of its least important forecasts fail of verification. An unexpected shower will interfere with the projected golf play or spoil a match of lawn tennis, and this is provocation enough for petulant and contemptuous criticism. But serious men engaged in serious occupations all over the country have cause to regard the Bureau as one of the most useful and beneficent of our Governmental institu-

tions. Indeed, it is more than a mere utility maintained at the expense of the taxpayers; it is an agency of incalculable profit to the whole people. It saves each year to the shipping, the insurance, and the agricultural interests, and to scores of other interests, subordinate to or involved in them, more money than is required to maintain the Bureau itself a thousand times over. The producers, the toilers, the millions depending for subsistence upon our great national industries, have never made, and will never make an investment even distantly approaching this in the matter of opulent returns.

BOSTON FORECAST DISTRICT.

Storm warnings were issued on the 2d, 3d, 4th, 7th, 8th, 14th, 15th, 16th, 17th, and 30th. During the storm of the 14th to 17th a persistent northeaster prevailed and shipping was tied up for a period of from four to six days. Warnings were displayed from twelve to eighteen hours in advance of the storm, and to this information was doubtless due the absence of loss of life and wreck of vessels. The press and the public generally gave due credit to the Bureau for its good work.—*J. W. Smith, Forecast Official.*

NEW ORLEANS FORECAST DISTRICT.

Several disturbances of moderate intensity crossed the district during the month. High winds occurred at some stations along the Gulf coast on the 3d, 4th, 13th, 14th, 29th, and 30th, for each of which timely warnings were issued. Very little rain fell in many parts of the district. Conditions were such as to warrant forecasts for showers on several occasions, but only inappreciable rainfall occurred, except in isolated cases, until the 29th, when general showers and, in some sections, good rains fell, for which forecasts were issued.

The temperature was generally below the normal, and the month closed as one of the coldest on record. Cold wave warnings were issued for Oklahoma on the 29th; the temperature fell 28° and to a minimum of 32° on the 30th. Warnings for general frosts for the greater portion of the district and heavy and probably killing frosts in the northern portion were issued April 30. Heavy and in some places killing frosts occurred in the northern portion of the district, and frost was reported well southward on May 1. These warnings saved several thousand dollars to trucking interests.

The river reached its highest stage, 20.4 feet, April 6 and 7. For a few hours at a time the stage was reported at 20.7 feet. The break in the levee 40 miles above New Orleans, known as the Hymelia crevasse, has not been closed. The cribbing around the break was joined April 6, but 200 feet of this washed out during the 8th and 9th, and the water cut a channel 30 feet deep. All efforts to stop the flow of water through the crevasse have been unsuccessful, but the work has not been abandoned. The river has been falling slowly since April 8.—*I. M. Cline, Forecast Official.*

CHICAGO FORECAST DISTRICT.

The regular season of navigation opened April 1, much earlier than usual. Several storms passed over the Lakes during the month and warnings were displayed with great frequency.

Southeast warnings were ordered in the afternoon of the 1st and changed to northwest in the morning of the 2d and to northeast in the morning of the 3d on Lakes Michigan and Huron. The storm advanced from the Rocky Mountain region with increasing force and caused high winds at nearly all stations on the 2d and 3d. Another storm developed in the west, for which southeast warnings were ordered on the upper Lakes at 6 p. m. of the 10th. Northeast warnings were ordered on Lakes Michigan and Huron at 10 a. m. of the 12th. They were changed to northwest warnings on the morning of the 13th and were continued for forty-eight hours. The storm moved very slowly and dangerous winds prevailed over the upper lakes for an unusually long period. Northwest warn-

ings were ordered on the 24th, and on the 28th northwest warnings were displayed on Lake Superior and northeast warnings on Lakes Michigan and Huron. The warnings were continued for forty-eight hours. This storm was not as severe as those which occurred earlier in the month. No wrecks of any kind were reported and it is thought that advantage was taken of the warnings in every case.

Unseasonably cold weather overspread the district during the latter part of the month and forecasts of freezing temperature were made on April 30 for the eastern and southern portions of the forecast district. The conditions were sufficiently severe to cause a flurry in the grain market, the prices rising decidedly as the result of the cold weather, as it was thought that considerable damage would be done.—*H. J. Cor, Professor of Meteorology.*

DENVER FORECAST DISTRICT.

Special warnings were issued well in advance of the cold snap that visited western Wyoming and Utah on the 2d and of the killing frost that occurred in western Colorado on the morning of the 5th. Warnings were also issued on the morning of the 10th for the killing frost that occurred in Utah on the 11th, and on the 29th for the severe freeze in southeastern Colorado and northern New Mexico. Vegetation was far advanced in the last-named districts and great damage resulted to fruit, gardens, etc.

Notices of light frosts were frequently included in the forecasts for such localities as the progress of vegetation warranted.—*F. H. Brandenburg, Forecast Official.*

SAN FRANCISCO FORECAST DISTRICT.

The month opened with a marked depression over Utah, accompanied by heavy rains over southern and central California, with snow in the mountains. The precipitation was also heavy in northern Arizona, the twenty-four hour rainfalls at Flagstaff on April 1 and 2 being 2.78 inches and 1.50 inches, respectively. In California, especially in the southern portion, rainfalls from 1 to 2 inches were recorded.

A persistent high off the coast of northern California and Oregon prevailed from April 2 to 9. A moderate depression over Nevada and Utah appears to have extended westward, overlying the Sierras and causing unsettled weather with showers generally in California on April 10.

The first reports from Southeast Farallon, 27 statute miles west of San Francisco, were received on April 17, a submarine cable having been successfully laid April 10 to 14.

Unsettled weather prevailed on April 16 and 17. At Los Angeles a twenty-four hour rainfall of 2.94 inches was reported on April 17. The remainder of the month was free from any marked disturbance.—*A. G. McAdie, Professor of Meteorology.*

PORTLAND, OREG., FORECAST DISTRICT.

In this district the month was dry and slightly cooler than usual, with no damaging storms. High winds occurred along the coast on the 6th and 7th for which warnings were issued in time to be of benefit to outgoing vessels.

During the latter part of the month frosts, which were accurately forecast, seriously damaged the peach crop of southern Oregon. Preventive measures, such as smudging, spraying, direct heating, etc., are not generally employed by horticulturists in this district and but few availed themselves of the opportunity presented by the warnings to protect their crops.—*Edward A. Beals, Forecast Official.*

AREAS OF HIGH AND LOW PRESSURE.

Movements of centers of areas of high and low pressure.

Number.	First observed.			Last observed.			Path.		Average velocity.	
	Date.	Lat. N.	Long. W.	Date.	Lat. N.	Long. W.	Length.	Duration.	Daily.	Hourly.
High areas.										
I.	3, p. m.	47	97	7, a. m.	47	60	<i>Miles.</i> 2,450	<i>Days.</i> 3.5	<i>Miles.</i> 700	<i>Miles.</i> 29.2
II.	11, a. m.	45	124	14, a. m.	41	101	1,225	3.0	408	17.0
III.	13, p. m.	47	101	18, a. m.	37	83	1,775	4.5	394	16.4
IV.	17, p. m.	38	123	20, p. m.	49	87	2,400	3.0	800	33.3
V.	21, p. m.	41	105	24, p. m.	30	82	1,700	3.0	567	23.6
VI.	21, p. m.	38	123	29, p. m.	27	80	4,250	8.0	531	22.1
VII.	25, a. m.	38	123	28, a. m.	48	123	850	3.0	283	11.8
VIII.	28, a. m.	53	108	29, a. m.	49	100	450	1.0	450	18.8
IX.	29, a. m.	38	123	*2, a. m.	48	122	750	3.0	250	10.4
X.	29, p. m.	41	105	*2, p. m.	47	60	2,600	3.0	867	36.1
Sums.							18,450	35.0	5,250	218.7
Mean of 10 paths.							1,845		525	21.9
Mean of 35.0 days.										22.0
Low areas.										
I.	1, a. m.	43	109	3, a. m.	49	69	2,000	2.0	1,000	41.7
II.	2, a. m.	37	105	4, p. m.	45	66	2,250	2.5	900	37.5
III.	3, a. m.	53	117	7, a. m.	49	89	1,950	4.0	488	20.3
IV.	6, p. m.	32	106	9, a. m.	44	67	2,450	2.5	980	40.8
V.	8, p. m.	42	118	15, a. m.	39	75	2,875	6.5	442	18.4
VI.	16, p. m.	39	120	21, p. m.	32	65	3,300	5.0	660	27.5
VII.	21, p. m.	51	120	28, a. m.	32	65	3,450	6.5	531	22.1
VIII.	25, p. m.	51	120	27, a. m.	50	97	1,100	1.5	733	30.6
IX.	29, a. m.	42	93	*1, a. m.	48	68	1,400	2.0	700	29.2
X.	30, a. m.	51	120	*4, a. m.	47	71	3,000	4.0	750	31.2
Sums.							23,775	36.5	7,184	299.3
Mean of 10 paths.							2,378		718	29.9
Mean of 36.5 days.										27.1

* May.

For graphic presentation of the movements of these highs and lows see Charts I and II.—*H. C. Frankenfield, Forecast Official.*

RIVERS AND FLOODS.

The stages of water in the Mississippi River were decidedly higher than during April, 1902, the excess ranging from 6 to 10 feet. Above the mouth of the Ohio the highest stages were due to the substantial and well distributed rainfall, while farther south the last of the flood waters of the preceding month of March passed slowly to the Gulf of Mexico, augmented by a moderate tide from the Ohio about the middle of the month. In fact, the crest of the flood of March, 1903, did not pass New Orleans until the 6th and 7th of April when a stage of 20.4 feet was reached, 4.4 feet above the danger line, and 0.9 foot higher than any previously recorded stage.

The arrival at St. Paul on the 14th of the steamer *Cyclone* marked the opening of through navigation on the Mississippi River for the season; it was seven days later than in 1902, when the same steamer was the first to pass through Lake Pepin.

Ice was last observed in the Missouri River on the 9th. Navigation at Pierre, S. Dak., was resumed for the season on the 6th, although the river was not entirely clear of ice until three days later. From the 5th to the 6th there was a rise at Bismarck, N. Dak., of 7 feet, of which the greater portion evidently came from the Yellowstone and Little Missouri rivers. The crest of this rise traveled steadily down the river, diminishing to about four feet by the time it reached Sioux City, Iowa, and to about two feet after leaving Kansas City, Mo. It reached St. Louis, 1330 miles from Bismarck, on the 18th.

The Illinois River continued above the nominal danger line throughout the month, the steady rains preventing any falls of consequence. No damage was reported.

Nothing of special interest occurred along the Ohio River, although the steady rains from the 7th to the 17th occasioned a sharp rise which was felt over the entire tributary district.